UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mineral resource potential of Mazatzal Wilderness and Contiguous Rare II Further Planning Area, Gila, Maricopa, and Yavapai Counties, Arizona

U.S. Bureau of Mines Mineral Land Assessment
MLA 56-82
1982

By
Ellis, C.E.

This open file report summarizes the results of a Bureau of Mines wilderness study and will be incorporated in a joint report with the U.S. Geological Survey. The report is preliminary and has not been edited or reviewed for conformity with the U.S. Bureau of Mines editorial standards. Work on this study was conduced by personnel from Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

UNITED STATES DEPARTMENT OF THE INTERIOR
(BUREAU OF MINES)

MINERAL-RESOURCE POTENTIAL OF THE MAZATZAL WILDERNESS AND CONTIGUOUS RARE II FURTHER PLANNING AREA, GILA, MARICOPA, AND YAVAPAI COUNTIES, ARIZONA

By
Clarence E. Ellis

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Mineral Surveys
Related to U.S. Forest Service
Wilderness Areas
and
RARE II Further Planning Areas

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Bureau of Mines and the U.S. Geological Survey to survey certain areas on Federal lands to determine their mineral-resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral-resource survey of the Mazatzal Wilderness in the Tonto National Forest, Gila, Maricopa, and Yavapai Counties, Arizona. The Mazatzal Primitive Area was established under Regulation L-20 of the Secretary of Agriculture in 1938. The status was changed to wilderness in 1940 under Regulation U-1 of the Secretary of Agriculture. With passage of the Wilderness Act the Mazatzal Wilderness was incorporated into the National Wilderness Preservation System. The Mazatzal Wilderness Contiguous Roadless Area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

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By Clarence E. Ellis, U.S. Bureau of Mines

INTRODUCTION

Field work was carried out by U.S. Bureau of Mines personnel Clarence E. Ellis, Don Brown, Dave Scott, Carl Almquist, John Briggs, and Mark Anders during spring and fall of 1979 and spring of 1980.

Location, size, and geographic setting

The Mazatzal Wilderness covers 205,346 acres (831 km^2) of the Tonto National Forest in Gila, Maricopa, and Yavapai Counties, east-central Arizona (fig. 1). On the west, north, and northeast sides of the Mazatzal Wilderness, the Mazatzal Wilderness Contiguous RARE II Further Planning Area covers 83,750 acres (338.9 km^2). The RARE II area is also part of the Tonto National Forest, and within the three named counties. Payson, Ariz., is 8 mi (13 km) east of the area, and Phoenix, Ariz., is 43 mi (69 km) south-southwest.

Arizona Highway 87 is 1 to 8 mi (1.6 to 13 km) east of the edge of the Wilderness. The Horseshoe Dam and Verde Hot Springs roads approach the western boundary of the RARE II area. Powerline roads parallel the west side of the RARE II area and touch the southeast corner of the Wilderness. Forest Service, mine, and ranch roads reach both boundaries at many locations and enter the Wilderness at the Doll Baby Ranch on the East Verde River.

The Verde River flows through the RARE II area west of the Wilderness, and the East Verde River cuts through the northern third of the Wilderness. Elevation ranges from 7,903 ft (2,409 m) on Mazatzal Peak to about 2,200 ft (670 m) near Horseshoe Reservior.

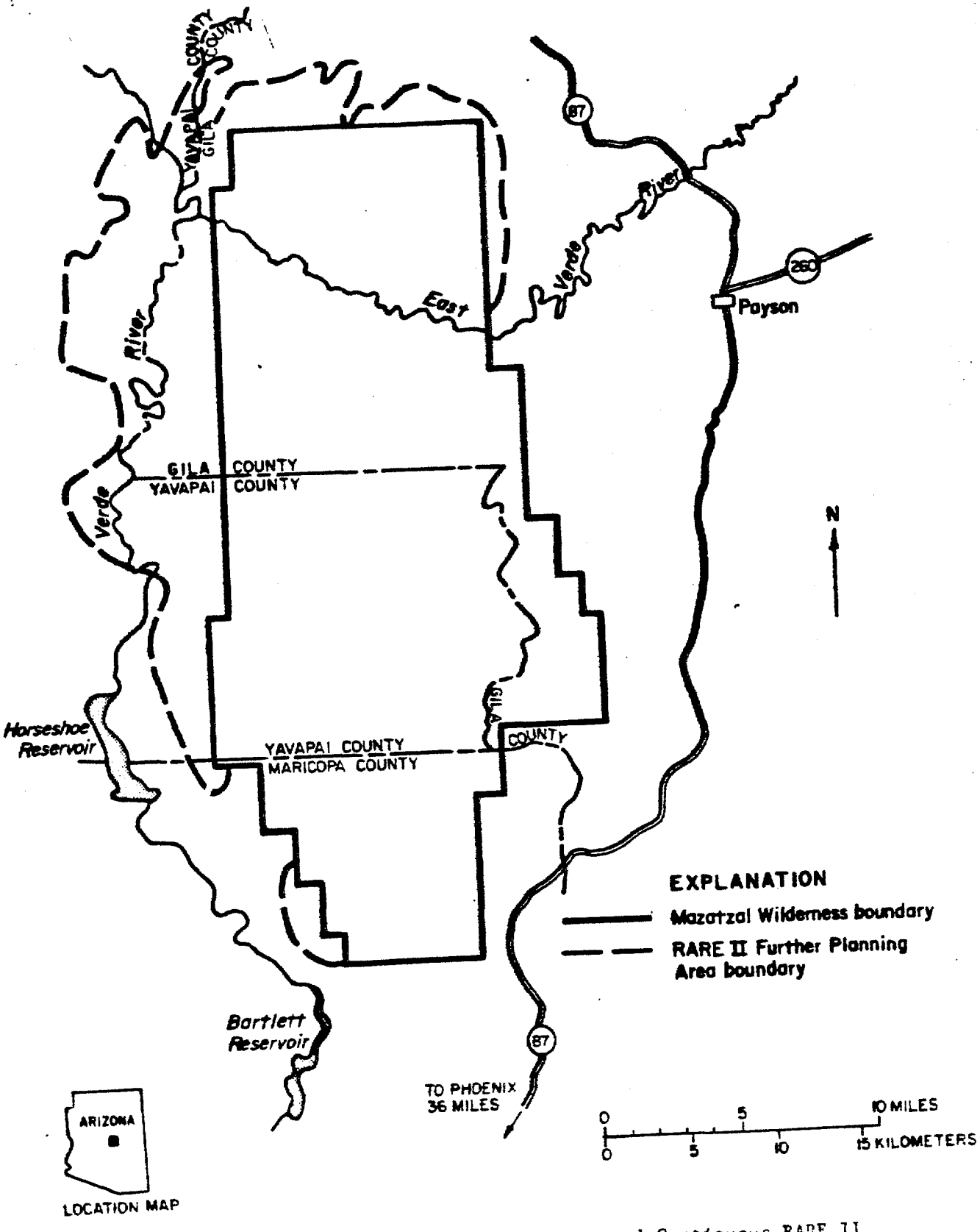

Figure 1.-Index map of the Mazatzal Wilderness and Contiguous RARE II Further Planning Area.

Mining activity

Mining activity in the area peaked in the 1880's, and has since remained at a low level. In 1979, an adit was being driven at the Sunflower Mine (Plate 1), and the road to the Casterson Mine was being repaired; both activities, however, were curtailed by 1980. In recent years there has been trenching at the Sunflower Mine; drilling and trenching at Mineral Canyon on the eastern boundary; trenching, geochemical, and geophysical prospecting, and minor copper-silver production at Copper Mountain inside the Wilderness; drilling for uranium near Horseshoe Dam near the RARE II area; and applications were filed with the U.S. Forest Service for permission to drill at Copper Camp Creek inside the Wilderness.

MINING DISTRICTS AND MINERALIZED AREAS

Mining Districts

Payson

The Payson, or Green Valley, mining district (Plate 1) surrounds Payson, except on the north. The part of the district adjacent to the Wilderness extends from just north of the East Verde River, to Eisenhauer Canyon on the south. Near the eastern Wilderness boundary, on gold-bearing quartz veins in a variety of igneous rocks of Precambrian age, are the Casterson, Collom, Crackerjack, Gowan, and House Mines (Plate 2). Except for the Gowan vein, which is traceable for possibly a half mile (800 m), the veins in these mines pinch out along strike within a few hundred feet (tens of meters), but extend deeper than the limits of development. They appear to fill tension gashes related to nearby major faults.

Sunflower

The Sunflower mercury district (Plate 1) is in an east-northeast-trending belt of Precambrian schist (Ransome, 1915) of the Alder Group near the southeast corner of the Wilderness. Just inside the Wilderness, volcanic rocks

cover the schist. The Cornucopia, Gold Creek, Mercuria, Oneida, Pine Butte, Pine Mountain, and Sunflower Mines (Plate 2) are near the Wilderness. Although on the mercury trend, the Storey Mine inside the Wilderness, is a silver-lead-gold deposit. Lithology or stratigraphy, rather than structure appears to have controlled ore deposition.

Mining Claims

A patented claim, the Blue Lode(?), is located inside the Wilderness in sec. 10, T. 9 N., R. 7 E. Large blocks of unpatented claims are at Copper Mountain, Copper Camp Creek, Mineral Canyon, Horseshoe Dam, Sunflower, and House Creek. Because few old claim descriptions are definitive, many mines and prospects cannot be correlated with claims.

Known Mineralized Areas

Copper Mountain

Just south of the East Verde River, and 1 to 5 mi (1.6 to 8 km) inside the Wilderness, the Copper Mountain group consists of a block of over 100 claims. Several miles of bulldozer roads, a 110- by 60- by 100-ft-deep (32- by 20- by 30-m-deep) open cut, and many old workings that are caved except for three short adits occur within the claim block. West of Bullfrog Canyon, silver is dominant in faults and sheared quartz veins in graywackes and siltstones near major faults. East of Bullfrog Canyon, the copper minerals chalcopyrite, bornite, and copper oxides are dominant, occurring as disseminations, blebs, and disseminations in quartz veins. Country rocks are mafic volcanics.

Mineral Canyon

A network of bulldozer roads covers the spur ridge on the north side of Mineral Canyon and extends into the Wilderness. A block of 56 claims covering this area has been known variously as the Big Penny and Big Bear group.

Freeport Exploration Co., Miami Copper Co., Phelps Dodge Corp., Phoenix Ventures, Pinal Copper Corp., and Viola Mac examined the property between 1957 and 1977. Disseminated copper oxides, occur in a brecciated complex of intermediate volcanic and plutonic rocks near a major fault intersection. The mineralized zone extends at least 1,500 ft (460 m) into the Wilderness.

Copper Camp Creek

Copper oxides are found at the Copper Cliff group of 22 claims in the center of the southern quarter of the Wilderness. Over a dozen pits and trenches, a 60-ft (20-m) shaft, and a 390-ft (120-m) adit are in the mineralized zone. Drilling was proposed by the claim owners in 1972, and recommended by a U.S. Forest Service examiner (U.S.F.S., 1973), but never carried out. Country rocks are Alder Group, mostly of volcanic derivation.

Horseshoe Dam

Low-grade uranium occurrences are present in Tertiary lake-basin sediments east of Horseshoe Dam. Two blocks of 150 claims each have been located, and at least three holes drilled. Some of these claims are in the RARE II area. A sample taken across a 4 in. (10 cm) bed assayed 165-ppm U_3O_8, but the next highest assay from beds in this basin was only 18 ppm.

Past and Present Mining Activity and Production Data

Gold was discovered in about 1875 near Payson, and the Payson mining district had its peak between 1881 and 1886 (Lausen and Wilson, 1925). Production from that period was not recorded. The district was more or less idle until the 1930's, after which there was sporadic production. Between 1938 and 1956 the Casterson, Collom, Crackerjack, and Gowan Mines produced (USBM Files):

gold:	199 oz	(6,190 g)
silver:	426 oz	(13.2 kg)
copper:	17,596 lb	(7,990 kg)

In 1967, 33.5 tons (30.4 t) of ore containing 938 lb (426 kg) of copper and 485 oz (15.1 kg) of silver were produced from the Copper Mountain open cut (USFS files).

Exploration for copper has been moderately active at Mineral Canyon from 1956 to 1977, at Copper Mountain from 1964 to present, at Copper Camp Creek from 1955 to 1972, and at Eisenhauer Canyon in 1957. Increasing precious metal prices have spurred renewed activity at several properties near Payson.

Mercury was discovered in the Sunflower mining district in October, 1911, (Ransome, 1915), which has remained intermittantly active until the present, although there has been little production since the 1960's. At present the only activity is at the Sunflower Mine.

The Pine Mountain and Sunflower Mines were the major mercury producers near the Wilderness. Other properties combined have contributed minor quantities of mercury. The Storey (Tri-Metals) Mine produced no mercury, and various mercury mines produced gold, silver, and copper. Recorded production (USBM and USFS Files except as noted) from 1913 to 1965 is:

mercury:	3,973 flasks	(137 t) (Beckman and Kerns, 1965)
gold:	764 oz	(23.8 kg)
silver:	1,095 oz	(34.1 kg)
copper:	2,140 lb	(970 kg)
lead:	27,650 lb	(12.5 t)

Resource Estimates

Deposits in, or within a half mile (0.8 km) of the Wilderness or RARE II area are listed here. Estimates are based on Bureau of Mines mapping and 570 Bureau of Mines samples taken in area. At the time of the study—1979 to 1981—all resources except the Storey Mine were sub-economic.

Payson District

Combined inferred resources of the Casterson and Collom Mines, just outside the Wilderness, are 52,000 tons (47,000 t) containing 0.07 oz of gold and 0.7 oz of silver per ton (2.3 g of gold and 25 g of silver per metric ton).

Copper Mountain has a moderate size copper-silver resource entirely inside the Wilderness. The mineralized area is 8,000 by 200 ft (2,400 by 60 m) with high-grade spots.

Mineral Canyon has a moderate size copper resource which is partly inside the Wilderness. The mineralized area is 3,000 by 800 ft (900 by 240 m).

Sunflower District

The Sunflower Mine has an inferred resource of 26,000 tons (24,000 t) containing 0.14-percent mercury just outside the Wilderness, and an inferred resource of 3,600 tons (3,300 t) containing 0.21-percent mercury just inside the Wilderness.

Inside the Wilderness, the Storey Mine has an inferred resource of 78,000 tons (71,000 t) containing 0.06 oz of gold and 1.9 oz of silver per ton (2.1 g of gold and 65 g of silver per metric ton) and 3.9-percent lead. This resource is calculated from surface exposures, as the workings are all caved. The known production has been subtracted from the calculated resource, however, any unrecorded production which may have occurred would also subtract from the quantity stated.

Copper Camp Creek has a moderate size copper resource entirely inside the Wilderness. The mineralized area is 3,000 by 200 ft (900 by 60 m).

ASSESSMENT OF MINERAL-RESOURCE POTENTIAL

This is a preliminary assessment based on Bureau of Mines data gathered during this investigation. Figure 2 shows the areas determined to have mineral-resource potential. For purposes of this report the following definitons are used: small resources/reserves - less than 100,000 tons (91,000 t), medium-size resources/reserves - 100,000 to one million tons (91,000 to 910,000 t), large resources/reserves-more than 1 million tons (910,000 t).

The Mazatzal Wilderness has copper, mercury, silver, gold, and lead resources. Dense chaparall and rugged terrain inhibit prospecting now, as in the past, and exploration would be difficult and costly.

Gold

Gold has been mined from quartz veins in Precambrian rocks lying near the Deadman, Verde, and Sheep Mountain faults mapped by Wrucke and Conway (in preparation) and the Payson granite. Except for the Gowan vein, these veins persist only a few hundred feet (tens of meters) along strike. No pinching of the veins down-dip was observed by the Bureau of Mines, nor was it reported by Lausen and Wilson (1925). Only free-milling gold was recoverable when the Payson district was active; therefore, development rarely proceeded more than tens of feet below the oxidized part of the vein. Vein configuration and proximity to the faults mentioned suggest that these veins filled tension gashes related to fault movement.

A moderate potential for gold exists in small- to medium-size, high - to moderate-grade veins in Precambrian rocks near these faults. Gold is expected as a byproduct of copper or mercury deposits.

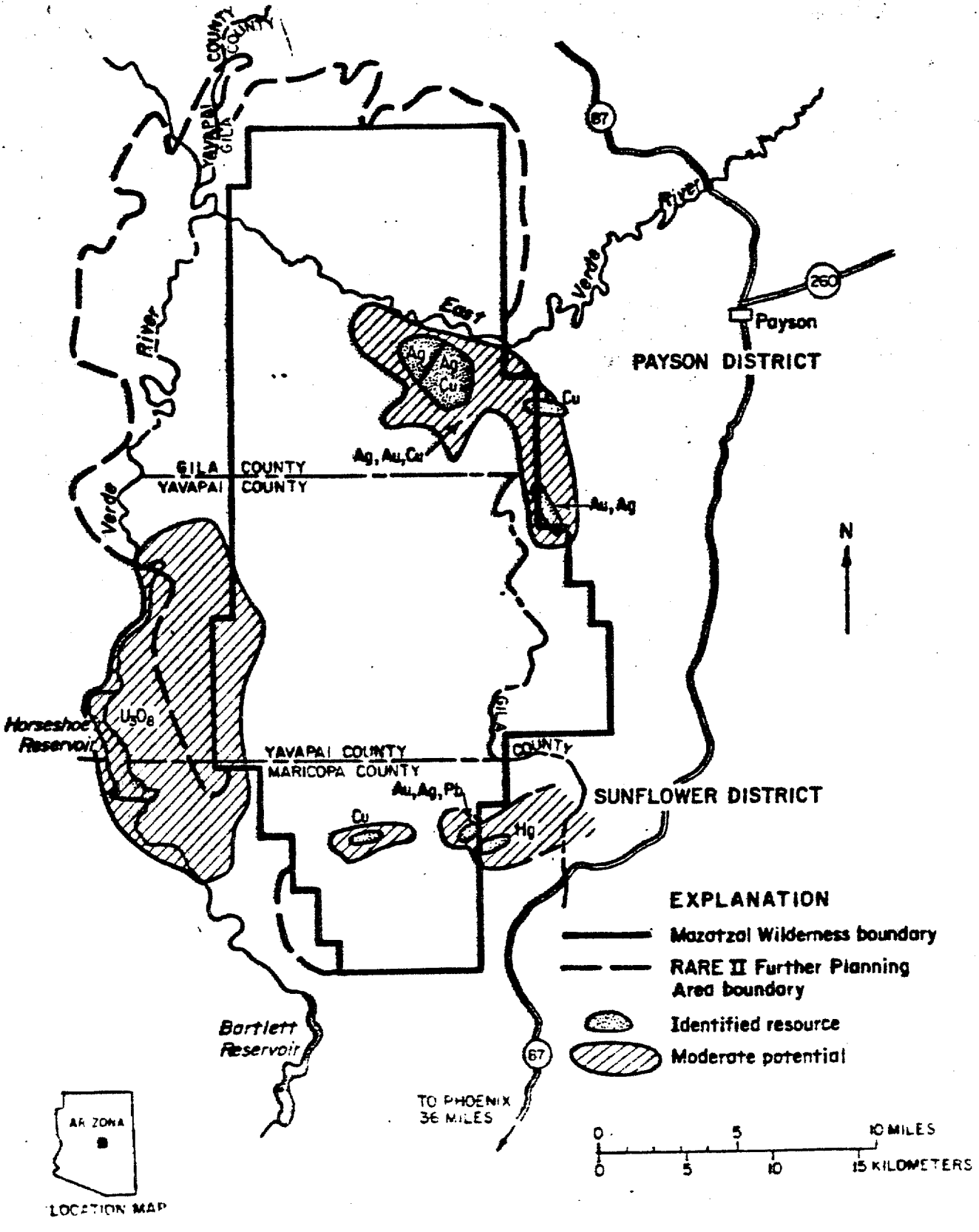

Figure 2.-Map of the Mazatzal Wilderness and Contiguous RARE II Further Planning Area showing preliminary determination of mineral-resource potential.

Silver

Silver accompanies gold in the vein systems described above, and would be a byproduct of mining copper or mercury deposits. Relationships of silver to copper are unclear west of Bullfrog Canyon in the sedimentary sequence of the Copper Mountain deposit. With this exception, silver potential is related directly to gold, mercury, and copper potential.

Copper

Some copper may be syngenetic with Precambrian volcanic-sedimentary rocks (upper Alder Group and Yavapai(?) Group), but if so, it is very spotty. Concentrations of copper from the Payson granite and the possible older sources are localized in brecciated zones related to intersection of the Verde and Deadman Fault, intersection of the Sheep Mountain Fault and local faults related to Tertiary plugs, or in permeable host rocks near major faults and the granite.

A moderate potential for copper exists in medium-size, low- to moderate-grade deposits in basic- to intermediate-volcanic rocks of Precambrian age which are near structural intersections and the Payson granite. A moderate potential for copper in small, high-grade deposits exists in Precambrian basic- to intermediate-volcanic rocks. The Mazatzal Wilderness and RARE II area is not a porphyry copper environment. Some copper would be a byproduct of mining gold-silver veins, and rarely might be recovered from mercury deposits.

Mercury

Alder Group rocks are the only host in this area for more than trace amounts of mercury. Quartz-sericite or chlorite schists are favored, probably due to permeability of the beds, or between the beds. The mercury, probably derived from the Payson granite and remobilized by the heat from Tertiary

stocks, was driven along permeable paths in the Alder Group beds. Deposition was probably a function of temperature.

A moderate potential for mercury in small, low- to moderate-grade deposits exists in the Precambrian Alder Group in proximity to the Payson granite, Sheep Mountain Fault and a Tertiary stock, which is to say within the present Sunflower district.

Lead

Lead is a major constituent of the Storey and Stingy Lady veins, but is otherwise uncommon in the Mazatzal Wilderness and RARE II area. These veins are short along strike, but their behavior along dip is unknown. Both are near major faults; the Storey is near the Payson granite, and the Stingy Lady within it.

A low potential exists for lead in small, high-grade vein deposits in Precambrian rocks in or near the Payson granite near major faults.

Uranium

Anomalous, but very low-grade uranium is found in tuffaceous sandstones in a Tertiary basin-fill. A moderate potential for uranium in medium-size, low-grade deposits exists in the Tertiary sediments in the Verde River valley, particullarly in the area receiving detritus from the uranium-bearing stock in Tangle Creek.

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UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

OPEN FILE REPORT
MLA 56-82
PLATE 1

Field work on the Mazatzal Wilderness and contiguous RARE II Further Planning Area was conducted in the spring and fall of 1979, and the spring of 1980. Field work was carried out by U.S. Bureau of Mines personnel Clarence E. Ellis, Don Brown, Dave Scott, Carl Almquist, John Briggs and Mark Anders in 1979, and Ellis and Almquist in 1980.

The Sunflower mercury mining district and Payson gold mining district are partly within the Wilderness. Other copper, silver, gold, and lead deposits are located inside the Wilderness, an uranium occurrence is partly within the RARE II area.

Payson Mining District

The Payson district was started in 1875, and was at its peak production between 1881 and 1886. Production from that period was not recorded. The district was more or less idle until the 1930's, after which there was sporadic production.

Recorded production from the Casterson, Collom, Crackerjack, and Gowan Mines, and from Copper Mountain between 1938 and 1956:

gold:	199 oz	(6.1 kg)
silver:	912 oz	(28.3 kg)
copper:	18,534 lb	(8.4 t)

Sunflower Mining District

The first mercury discovery in the district was in October, 1911. Activity has been intermittent to the present, although no significant production has been achieved since the 1960's.

Recorded production from the Cornucopia, Gold Creek, Mercuria, Oneida, Pine Mountain, Storey, and Sunflower Mines between 1913 and 1965:

mercury:	3,973 flasks	(137 t)
gold:	764 oz	(23.8 kg)
silver:	1,095 oz	(34.1 kg)
lead:	27,650 lb	(12.5 t)
copper:	2,140 lb	(970 kg)

Table 1. -- Summary of information derived [illegible] Bureau of Mines examination of known mineral [illegible] Further Planning Area.

Deposit	Recorded Production[2]	Workings	Wall Rocks	Geologic Control	Average Grade	Minor Minerals	Resources/ Reserves[1]	Location
Casterson Mine (Blue Bell claims)	Small Au, Ag, Cu.	2 adits: lower: 110 ft (30 m) drift on vein. Upper: 330 ft (100 m) drift on vein accessible; raise from upper level to surface.	Basic to intermediate volcanic.	N-S, vertical quartz vein, 1-2 ft (0.3-0.6 m) wide; explored 430 ft (140 m) along strike and about 250 ft (83 m) down dip.	.08 oz/ton Au (2.7 g/t) 0.45 oz/ton Ag (15 g/t).	Galena, Chalcopyrite.	Small indicated, small inferred.	Sec. 16, 17, T. 9 N., R. 9 E.
Collom Mine	Moderate Ag.	3 adits: 1 caved, upper; 240 ft (80 m), not on vein. Lower; cross-cuts to intersecting veins, 372 ft (124 m) of drifts on veins.	Basic to intermediate volcanic.	Intersecting quartz veins: N 50° W, dipping 45° SW, 1-3 ft (0.3-0.9 m) wide, explored 204 ft (65 m) along strike. N-S, dipping 50° W, 1-4 ft (0.3-1.2 m) wide, explored 168 ft (56 m) along strike.	N 50° W vein: .01 oz/ton Au (0.3 g/t) 1.43 oz/ton Ag (49 g/t) N-S vein: .01 oz/ton Au (0.3 g/t) 0.24 oz/ton Ag (8.2 g/t).	Galena, [illegible]pyrite.	Small inferred.	Sec. 8, 9, T. 9 N., R. 9 E.
Copper Camp Creek	Small, if any.	390 ft (130 m) adit, 60 ft (20 m) shaft, several pits.	Alder Group, conglomerate seems favored.	Mineralized zone cuts bedding at small angle.	Adit: 0.71% Cu, 0.2 oz/ton Ag (7 g/t).	Gold.	2,700 x 200 ft (820 x 60 m) mineralized zone.	Sec. 7, T. 7 N., R. 8 E.
Copper Mountain	Moderate Ag, small Cu.	Open cut, 5 adits, (2 caved), many pits.	Yavapai Group? basic lavas overlain by jasper & rhyolite overlain by graywacke.	Cu in basic lavas below jasper bed. Cu & Ag in shears in basic volcanics, Ag in shears in graywacke near major faults.		Gold.	8,000 x 200 ft (2,400 x 60 m) mineralized zone.	Sec. 9, 10, 15-17, 21, T. 10 N., R. 8 E.
Cornucopia Mine	Small Au, Ag, moderate Hg?	2 adits connected by 500 ft (150 m) raise. Upper; 285 ft (95 m) lower; 656 ft (219 m).	Alder Group quartz-sericite schist.	Quartz veinlets parallel to schistosity.	Upper adit: 116 ppm Hg. Across veinlets; 1.4 % Hg. Lower adit: 26 ppm Hg. Across veinlets 0.13% Hg.	Silver.		Sec. 12, T. 7 N., R. 8 E.
Crackerjack Mine	Small Au, Ag, moderate Cu.	Shaft, adit to lowest level.	Granite-mafic volcanic breccia.	2 parallel quartz veins; N 70° W, vertical, 1-5 ft (0.3-1.5 m) wide, 200 ft (60 m) and 120 ft (40 m) strike lengths.	2% Cu, 0.1-0.3 oz/ton Ag (3-10 g/t) Wall rocks: 500 ppm Cu.	Gold.	Upper levels may be mined out, small inferred resource below level.	Sec. 22 T. 11 N R. 9 E.
Gold Creek Mine	Small Hg.	Open cut above 290 ft (93 m) adit.	Alder Group quartz-sericite schist.	Lithology?	20 ppm Hg.			Sec. 26 T. 8 N., R. 9 E.
Gowan Mine	Moderate Au, small Ag, Cu after 1934. Moderate-large Au 1891-1896.	70 ft (23 m) inclined shaft, 240 ft (80 m) drift on vein, stopes on 2 levels.	Sandstone hanging wall, diorite footwall.	Quartz vein in fault, N to N 35° W, dipping 35° NE, 1-5 ft (0.3-1.5 m) wide, 100 ft (30 m) post-mineral displacement, explored 240 ft (80 m) along strike and 70 ft (23 m) down dip.	.05 oz/ton Au (1.7 g/t) 0.25 oz/ton Ag (8.6 g/t).		Small inferred.	Sec. 34 T. 11 N R. 9 E
Horseshoe Dam	None.	3 drill holes.	Tertiary lake beds; locally tuffaceous sandstone.	Lithology.	Less than 13 ppm U_3O_8.			Sec. 1, T. 7 N., R. 6 E. Sec. 6, T. 7 N., R. 7 E.
House Mine	Small Au, Ag.	Adit, caved over 200 ft (70 m) from portal, still in colluvium.	Diorite.	Quartz vein material on dump.	?			Sec. 32 T. 10 N. R. 9 E.
Mercuria Mine	Small Hg.	Open cut, 15 drill holes, 3 adits.	Alder Group quartz-sericite schist.	Lithology?	Open cut: 107 ppm Hg.			Sec. 4, T. 7 N., R. 9 E.
Mineral Canyon	None.	27 drill holes, roads, pits.	Intermediate volcanic and plutonic rocks.	Breccia zone near intersection of major faults.	.09% Cu.	Silver.	2,600 x 800 ft (790 x 240 m) mineralized zone.	Sec. 29, 30, T. 10 N. R. 9 E.
Oneida Mine	Small Hg.	Open cut, 2 adits; north adit [illegible] south adit 1,200 ft (400 m).	Alder Group quartz-sericite schist.	Lithology?	North adit: 260 ppm Hg, south adit: 27 ppm Hg.			Sec. 8, T. 7 N., R. 9 E.
Pine Butte Mine	?	2 open cuts, shaft.	Alder Group quartz-sericite schist.	Lithology?	50 ppm Hg.			Sec. 34, T. 8 N., R. 9 E.
Pine Mountain Mine	Small Au, Ag, Cu, Pb, moderate Hg.	2 adits & shafts to 6 levels (all inaccessible), (Fredrick, 1964) 2 open cuts.	Alder Group quartz-sericite schist.	Lithology?	East pit: 90 ppm Hg, west pit: 281 ppm Hg.			Sec. 4, 5, T. 7 N., R. 7 E.
Storey Mine	Small Au, large Ag, Pb.	2 adits, shaft, all caved.	Alder Group quartz-sericite schist.	Quartz-sulfide vein N 40° E, dipping 60° NW, 1-4 ft (0.3-1.2 m) wide, sub-parallel to schistosity.	.06 oz/ton Au (2.1 g/t) 1.9 oz/ton Ag (65 g/t) 3.9% Pb 0.03% Cu.		Small inferred.	Sec. 11, T. 7 N., R. 8 E.
Sunflower Mine (National Mine)	Moderate-high Hg.	10 adits totaling 2,270 ft (756 m), 2 open cuts.	Alder Group: quartz-sericite schist in pit, chlorite schist in 300 ft (100 m) adit, mostly quartz-sericite schist elsewhere.	Lithology and quartz pods parallel to schistosity.	Upper pit: 0.14% Hg, 300 ft (100 m) adit inside Wilderness: 0.21% Hg, other: 14 ppm Hg.	Silver, Gold.	Small inferred.	Sec. 12, 13, 14, T. 7 N., R. 8 E.

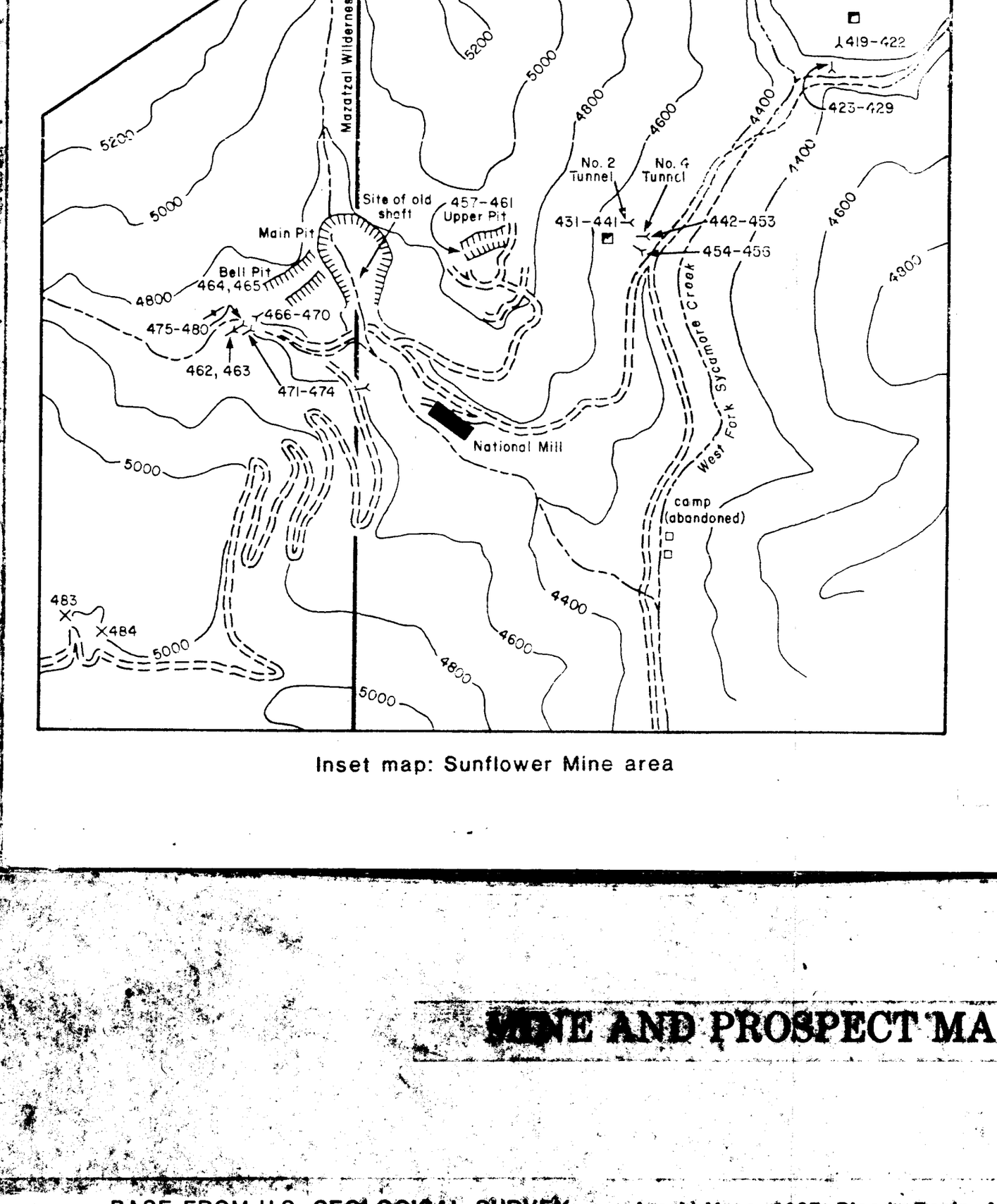
[1] Most deposits listed are resources (currently sub-economic), but some are borderline and could be economic from time to time as metal prices fluctuate. At times of high prices they would constitute reserves.
[2] For purposes of this report, the following definitions are used:
Small production - Less than 100 oz (3.4 kg) Ag or Au, or 5,000 lb (2,300 kg) Cu or Pb, or 500 flasks (17 t) Hg.
Moderate production - 100 to 500 oz (3.4 to 17 kg) Ag or Au, 5,000 to 25,000 lb (2.3 to 11.3 t) Cu or Pb, or 500 to 2,500 flasks (17 to 85 t) Hg.
Large production - More than 500 oz (17 kg) Ag or Au, or 25,000 lb (11.3 t) Cu or Pb, or 2,500 flasks (85 t) Hg.
Small resources/reserves - Less than 100,000 tons (91,000 t).
Moderate resources/reserves - 100,000 to 1,000,000 tons (91,000 to 910,000 t).
Large resources/reserves - More than 1,000,000 tons (910,000 t).

TABLE 2.- Copper Mountain sample data

Sample		Analytical data		
		oz/ton		percent
No.	Description	Ag	Au	Cu
1	dump, small caved adit	-	-	-
2	3.6 ft chip, pit	0.1	-	-
3	3.2 ft chip, pit	1.0	-	-
4	3.0 ft chip, adit back	-	-	-
5	4.0 ft chip, adit back	-	-	-
6	4.0 ft chip, outcrop	.2	-	-
7	dump, 50 ft shaft	22.8	-	2.0
8	dump, caved adit	2.9	-	-
9	5.0 ft chip, adit back	.2	-	-
10	3.3 ft chip, adit back	.3	-	-
11	grab, open cut	-	-	-
12	3.6 ft chip, quartz vein	.3	-	-
13	13.0 ft chip, breccia zone	.2	0.01	-
14	2.9 ft chip, pit	2.2	-	2.1
15	2.3 ft chip, pit	.1	-	.05
16	3.0 ft chip, pit	-	-	.11
17	2.6 ft chip, adit back	.3	-	.14
18	specimen from above sample	7.1	.08	8.0
19	5.6 ft chip, jasper contact	.4	-	.40
20	3.0 ft chip, quartz vein	.9	.01	.04
21	3.3 ft chip, quartz vein	.3	-	3.8
22	6.8 ft chip, pit	1.5	.01	1.7
23	4.2 ft chip, adit back	.36	-	-
24	4.0 ft chip, adit back	.6	.01	.68
25	4.2 ft chip, adit back	.2	-	.88
26	3.0 ft chip, adit back	.4	-	1.5
27	grab, stockpile	.6	.01	6.8
28	dump, caved adit	.2	-	.07
29	10.0 ft chip, jasper outcrop	.2	-	-
30	do.	.1	-	-
31	dump, caved adit	.2	-	.03
32	29.0 ft chip, trench	.2	-	.86
33	specimen from above sample	.4	-	3.4
34	10.0 ft chip, outcrop	-	-	.12
35	specimen, bulldozer cut	1.5	-	4.1
36	dump, caved adit	-	-	-
37	10.0 ft chip, outcrop	-	-	-
38	4.3 ft chip, outcrop	-	-	.03
39	specimen from sample 40	.5	-	1.5
40	dump, caved pit	.1	-	.10
41	10.0 ft chip, trench	-	-	.24
42	do.	-	-	.47
43	3.8 ft chip, pit	.4	-	.47

TABLE 3.- Copper Camp Creek sample data

Sample		Analytical data		
		oz/ton		percent
No.	Description	Ag	Au	Cu
505	5.2 ft chip, trench	0.1	-	0.35
506	4.0 ft chip, trench	.2	-	.02
507	15.4 ft chip, trench	.5	-	1.3
508	20.7 ft chip, trench	.3	0.01	1.7
509	dump, 60 ft shaft	.3	-	1.5
510	5.0 ft chip, trench	.4	-	1.9
511	4.1 ft chip, trench	.3	-	.5
512	3.6 ft chip, trench	.2	-	.05
513	4.3 ft chip, trench	-	-	.43
514	4.0 ft chip, trench	.4	-	-
515	4.0 ft chip, trench	-	-	.01
516	5.0 ft chip, trench	-	-	.01
517	4.0 ft chip, trench	-	-	.02
518	dump, caved trench	-	-	.16
519	4.0 ft chip, trench	-	-	5.0
520	6.0 ft chip, trench	5.8	.27	-
521	dump, caved pit	-	-	.3
522	dump, caved trench	-	-	.01



Inset map: Sunflower Mine area

* The analytical results for samples shown on this map are on file at the U.S. Bureau of Mines Intermountain Field Operations Center in Denver, Colorado, and are available there for viewing. Some results are shown on Plate 2.

Scale 1:48,000

MINE AND PROSPECT MAP OF THE MAZATZAL WILDERNESS AND CONTIGUOUS RARE II FURTHER PLANNING AREA, GILA, MARICOPA, AND YAVAPAI COUNTIES, ARIZONA

BY

CLARENCE E. ELLIS, U. S. BUREAU OF MINES

1981

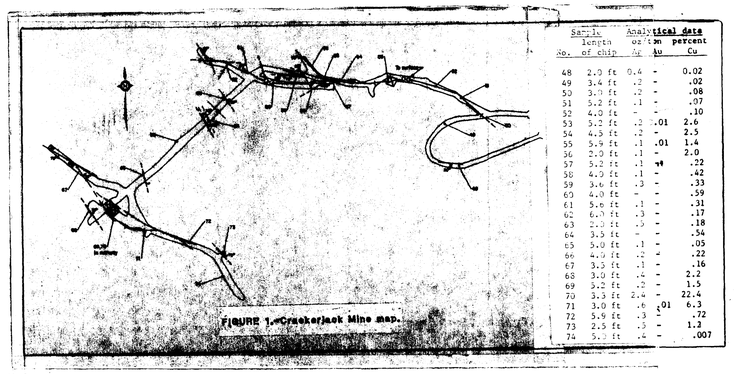
BASE FROM U.S. GEOLOGICAL SURVEY Arnold Mesa, 1967; Bloody Basin, 1967; Buckhead Mesa, 1973; Cane Springs Mountain, 1967; Chalk Mountain, 1967; Cypress Butte, 1967; Hackberry Mountain, 1967; Horseshoe Dam, 1964; Humboldt Mountain, 1964; Lion Mountain, 1964; Mazatzal Peak, 1972; North Peak, 1973; Pine, 1973; Reno Pass, 1964; Rover Peak, 1967; Strawberry, 1967; Table Mountain, 1967; Tule Mesa, 1967; Verde Hot Springs, 1967; Wet Bottom Mesa, 1967.

Sampling and surveying completed in 1980 by Clarence Ellis, Don Brown, Dave Scott, Carl Almquist, John Briggs, and Mark Anders

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

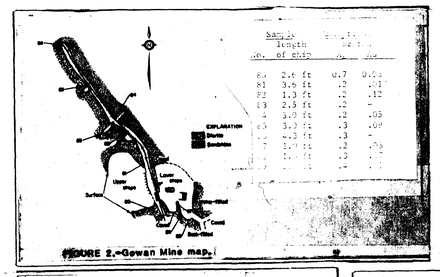
OPEN FILE REPORT

PLATE 2



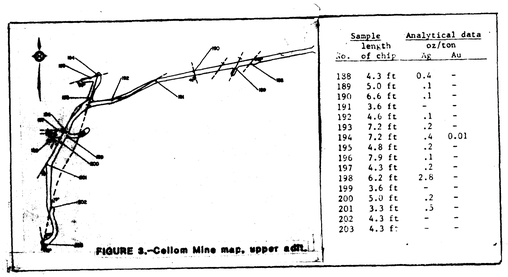
Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	percent Cu
48	2.0 ft	0.4	-	0.02
49	3.4 ft	.2	-	.02
50	3.0 ft	.2	-	.08
51	5.2 ft	.1	-	.07
52	4.0 ft	-	-	.10
53	5.2 ft	.2	.01	2.6
54	4.5 ft	.2	-	2.5
55	5.9 ft	.1	.01	1.4
56	5.0 ft	.1	-	2.0
57	5.2 ft	.1	-	.22
58	4.0 ft	.1	-	.42
59	3.6 ft	.3	-	.33
60	4.0 ft	-	-	.59
61	5.6 ft	.1	-	.31
62	6.0 ft	.3	-	.17
63	5.0 ft	.9	-	.18
64	3.5 ft	-	-	.54
65	5.0 ft	.1	-	.05
66	4.0 ft	.1	-	.22
67	3.5 ft	.1	-	.16
68	3.0 ft	.4	-	2.2
69	3.2 ft	.2	-	1.5
70	3.3 ft	2.4	-	22.4
71	3.0 ft	.6	.01	6.3
72	5.9 ft	.3	-	.72
73	2.5 ft	.5	-	1.3
74	5.1 ft	.4	-	.007

FIGURE 1.–Crackerjack Mine map.



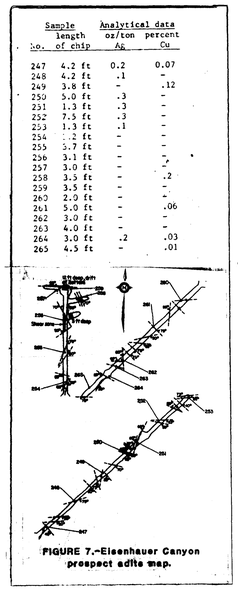
Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	percent Cu
80	2.6 ft	0.7	0.03	-
81	3.6 ft	.2	.01	-
82	1.3 ft	.2	.12	-
83	2.5 ft	.2	-	-
[illegible]	3.0 ft	.2	.05	-
85	3.0 ft	.3	.09	-
[illegible]	[illegible] ft	.3	-	-
[illegible]	[illegible] ft	.3	.05	-
[illegible]	[illegible] ft	.3	-	-
[illegible]	[illegible] ft	-	-	-

FIGURE 2.–Gowan Mine map.



Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au
188	4.3 ft	0.4	-
189	5.0 ft	.1	-
190	6.6 ft	.1	-
191	3.6 ft	-	-
192	4.6 ft	.1	-
193	7.2 ft	.2	-
194	7.2 ft	.4	0.01
195	4.8 ft	.2	-
196	7.9 ft	.1	-
197	4.3 ft	.2	-
198	6.2 ft	2.8	-
199	3.6 ft	-	-
200	5.0 ft	.2	-
201	3.3 ft	.5	-
202	4.3 ft	-	-
203	4.3 ft	-	-

FIGURE 3.–Cellom Mine map, upper adit.



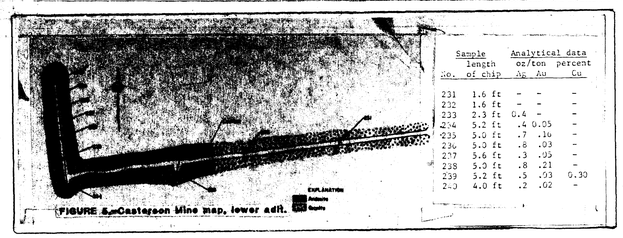
Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	percent Cu
247	4.2 ft	0.2	-	0.07
248	4.2 ft	.1	-	-
249	3.8 ft	-	-	.12
250	5.0 ft	.3	-	-
251	1.3 ft	.3	-	-
252	7.5 ft	.3	-	-
253	1.3 ft	.1	-	-
254	.2 ft	-	-	-
255	5.7 ft	-	-	-
256	3.1 ft	-	-	-
257	3.0 ft	-	-	-
258	3.5 ft	-	-	.2
259	3.5 ft	-	-	-
260	2.0 ft	-	-	-
261	5.0 ft	-	-	.06
262	3.0 ft	-	-	-
263	4.0 ft	-	-	-
264	3.0 ft	.2	-	.03
265	4.5 ft	-	-	.01

EXPLANATION

- 480 — Sample location and number*
- 80° — Vein, showing dip
- Vertical vein
- 70° — Fault, showing dip
- Vertical fault
- 60° — Schistosity, showing dip
- Vertical schistosity
- 35° — Bedding, showing dip
- Manway
- Ore chute
- Raise
- Raise and winze
- Winze
- Inclined winze
- Lagging

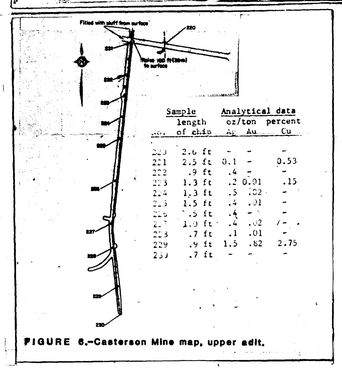
0 50 100 150 FEET
0 10 20 30 40 METERS

*All samples shown were continuous chips.



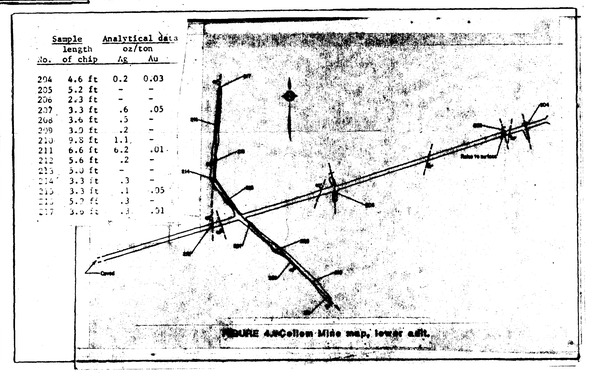
Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	percent Cu
231	1.6 ft	-	-	-
232	1.6 ft	-	-	-
233	2.3 ft	0.4	-	-
234	5.2 ft	.4	0.05	-
235	5.0 ft	.7	.16	-
236	5.0 ft	.8	.03	-
237	5.6 ft	.3	.05	-
238	5.2 ft	.8	.21	-
239	3.2 ft	.5	.03	0.30
240	4.0 ft	.2	.02	-

FIGURE 5.–Casteroon Mine map, lower adit.



Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	percent Cu
220	2.6 ft	-	-	-
221	2.5 ft	0.1	-	0.53
222	.9 ft	.4	-	-
223	1.3 ft	.2	0.01	.15
224	1.3 ft	.5	.02	-
225	1.5 ft	.4	.01	-
226	.5 ft	.4	-	-
227	1.9 ft	.4	.02	-
228	.7 ft	.1	.01	-
229	.9 ft	1.5	.82	2.75
230	.7 ft	-	-	-

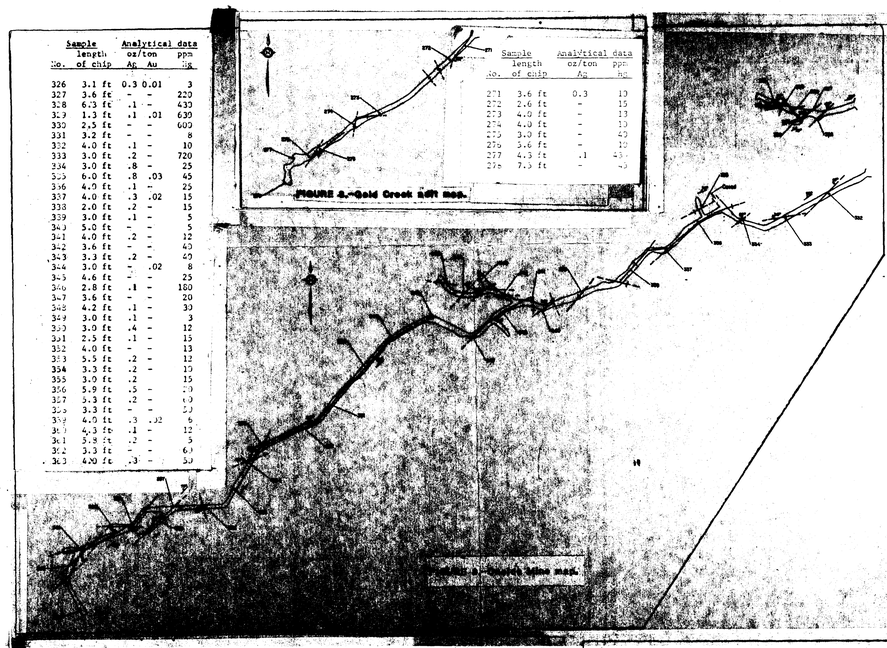
FIGURE 6.–Casteroon Mine map, upper adit.



Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au
204	4.6 ft	0.2	0.03
205	5.2 ft	-	-
206	2.3 ft	-	-
207	3.3 ft	.6	.05
208	3.6 ft	.5	-
209	3.0 ft	.2	-
210	9.8 ft	1.1	-
211	6.6 ft	0.2	.01
212	5.6 ft	.2	-
213	3.0 ft	-	-
214	3.3 ft	.3	-
215	3.3 ft	.1	.05
216	5.7 ft	.3	-
217	3.9 ft	.3	.91

FIGURE 4.–Cellom Mine map, lower adit.

WORKINGS IN THE PAYSON MINING DISTRICT

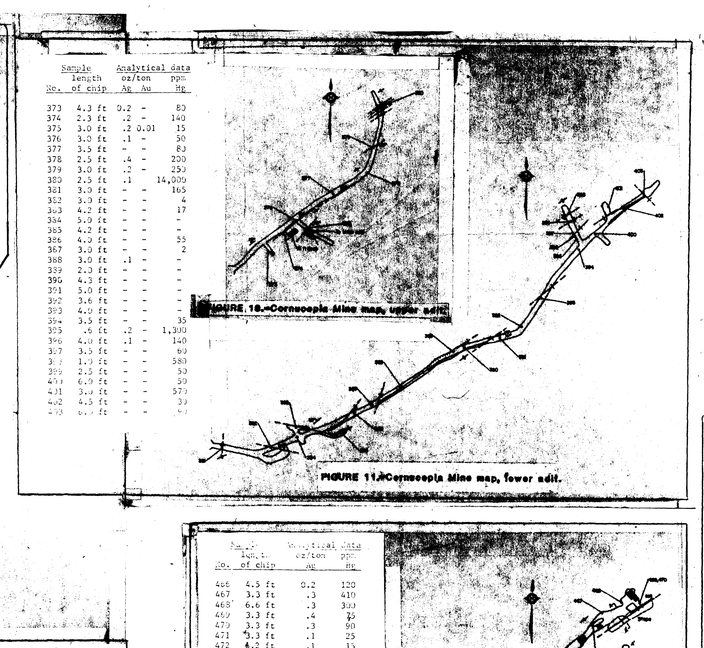


Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	ppm Hg
326	3.1 ft	0.3	0.01	3
327	3.6 ft	-	-	220
328	6.3 ft	.1	-	430
329	1.3 ft	.1	.01	630
330	2.5 ft	-	-	600
331	3.2 ft	-	-	8
332	4.0 ft	.1	-	10
333	3.0 ft	.2	-	720
334	3.0 ft	.8	-	25
335	6.0 ft	.8	.03	45
336	4.0 ft	.1	-	25
337	4.0 ft	.3	.02	15
338	2.0 ft	.2	-	15
339	3.0 ft	.1	-	5
340	5.0 ft	-	-	5
341	4.0 ft	.2	-	12
342	3.6 ft	-	-	45
343	3.3 ft	.2	-	40
344	3.0 ft	-	.02	8
345	4.6 ft	.1	-	25
346	2.8 ft	.1	-	180
347	3.6 ft	-	-	20
348	4.2 ft	.1	-	30
349	3.0 ft	.1	-	3
350	3.0 ft	.4	-	12
351	2.5 ft	.1	-	15
352	4.0 ft	-	-	13
353	5.5 ft	.2	-	12
354	3.3 ft	.2	-	10
355	3.0 ft	.2	-	15
356	5.9 ft	.5	-	70
357	5.3 ft	.2	-	60
358	3.3 ft	-	-	50
359	4.0 ft	.3	.02	6
360	4.3 ft	.1	-	12
361	5.8 ft	.2	-	5
362	3.3 ft	-	-	60
363	4.0 ft	.3	-	30

FIGURE 8.–Gold Creek adit map.

Sample No.	Sample length of chip	Analytical data oz/ton Ag	ppm Hg
271	3.6 ft	0.3	10
272	2.6 ft	-	15
273	4.0 ft	-	13
274	4.0 ft	-	10
275	3.0 ft	-	60
276	3.6 ft	-	10
277	4.3 ft	.1	45
278	7.3 ft	-	40

FIGURE 9.–Gold Creek adit map.



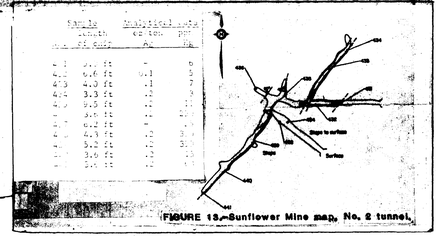
Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	ppm Hg
373	4.3 ft	0.2	-	80
374	2.3 ft	.2	-	140
375	3.0 ft	.2	0.01	15
376	3.0 ft	.1	-	50
377	3.5 ft	-	-	80
378	2.5 ft	.4	-	200
379	3.0 ft	.2	-	250
380	2.5 ft	.1	-	14,000
381	3.0 ft	-	-	165
382	3.0 ft	-	-	4
383	4.2 ft	-	-	17
384	5.9 ft	-	-	-
385	4.2 ft	-	-	-
386	4.0 ft	-	-	55
387	3.0 ft	-	-	2
388	3.0 ft	.1	-	-
389	2.0 ft	-	-	-
390	4.3 ft	-	-	-
391	5.0 ft	-	-	-
392	3.6 ft	-	-	-
393	4.0 ft	-	-	-
394	3.9 ft	-	-	35
395	.6 ft	.2	-	1,300
396	4.0 ft	.1	-	140
397	3.5 ft	-	-	80
398	1.0 ft	-	-	580
399	2.5 ft	-	-	50
400	6.0 ft	-	-	50
401	3.4 ft	-	-	570
402	4.5 ft	-	-	30
403	6.0 ft	-	-	60

FIGURE 11.–Corncoopia Mine map, lower adit.

FIGURE 10.–Corncoopia Mine map, upper adits.

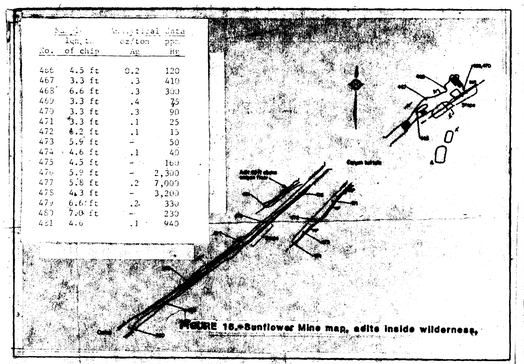
Sample No.	Sample length of chip	Analytical data oz/ton Ag	ppm Hg
442	7.7 ft	0.3	3
443	6.0 ft	.3	10
444	1.0 ft	.1	9
445	9.0 ft	-	12
446	3.0 ft	.3	3
447	3.3 ft	.1	7
448	4.3 ft	.1	25
449	4.0 ft	.2	470
450	3.6 ft	.3	5
451	6.0 ft	.1	6
452	5.0 ft	.2	520
453	4.0 ft	.2	5

FIGURE 14.–Sunflower Mine map, No. 4 Tunnel.



Sample No.	Sample length of chip	Analytical data oz/ton Ag	ppm Hg
463	6.6 ft	0.1	7
464	3.3 ft	.2	3
465	9.5 ft	.1	7
466	6.2 ft	-	3
467	4.3 ft	.2	10
468	3.6 ft	.2	15
469	3.0 ft	.1	5

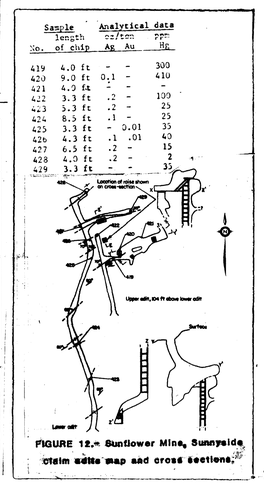
FIGURE 13.–Sunflower Mine map, No. 2 tunnel.



Sample No.	Sample length of chip	Analytical data oz/ton Ag	ppm Hg
466	4.5 ft	0.2	120
467	3.3 ft	.3	410
468	6.6 ft	.3	300
469	3.3 ft	.4	70
470	3.3 ft	.3	90
471	3.3 ft	.1	25
472	6.2 ft	.1	15
473	3.9 ft	-	50
474	4.6 ft	.1	40
475	4.5 ft	-	100
476	5.9 ft	-	2,300
477	5.8 ft	.2	7,000
478	4.3 ft	-	3,200
479	6.6 ft	.2	330
480	7.0 ft	-	230
481	4.6	.1	940

FIGURE 15.–Sunflower Mine map, adits inside wilderness.

WORKINGS IN THE SUNFLOWER MINING DISTRICT



Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	ppm Hg
419	4.0 ft	-	-	300
420	9.0 ft	0.1	-	410
421	4.0 ft	.1	-	-
422	3.3 ft	.2	-	100
423	3.3 ft	.2	-	25
424	8.5 ft	.1	-	25
425	3.3 ft	-	0.01	35
426	4.3 ft	.1	.01	40
427	6.5 ft	.2	-	15
428	4.0 ft	.2	-	2
429	3.3 ft	-	-	35

FIGURE 12.– Sunflower Mine, Sunnyside claim adits map and cross sections.

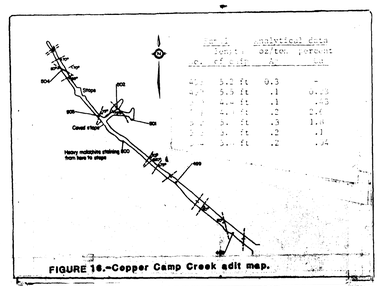
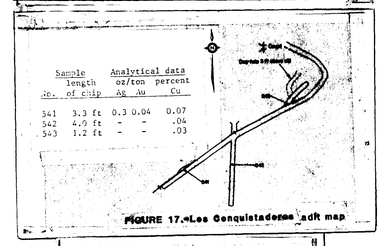
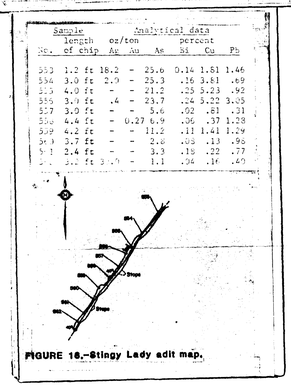


FIGURE 16.–Copper Camp Creek adit map.



Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	percent Cu
541	3.3 ft	0.3	0.04	0.07
542	4.9 ft	-	-	.04
543	1.2 ft	-	-	.03

FIGURE 17.–Los Conquistadores adit map



Sample No.	Sample length of chip	Analytical data oz/ton Ag	Au	Ag	percent Cu	Pb
553	1.2 ft	18.2	-	25.6	0.14	1.81 1.46
554	3.0 ft	2.9	-	25.3	.16	3.81 .69
555	4.0 ft	-	-	21.2	.25	5.23 .92
556	3.0 ft	.4	-	23.7	.24	5.22 3.05
557	3.0 ft	-	-	5.6	.02	.81 .31
558	4.4 ft	-	0.27	6.9	.06	.37 1.28
559	4.2 ft	-	-	11.2	.11	1.41 1.29
560	3.7 ft	-	-	2.6	.03	.13 .95
561	2.4 ft	-	-	3.3	.15	.22 .77
562	3.0 ft	3.0	-	1.1	.04	.17 .40

FIGURE 18.–Stingy Lady adit map.

WORKINGS WHICH DO NOT BELONG IN ANY MINING DISTRICT

MAPS OF WORKINGS IN AND NEAR THE MAZATZAL WILDERNESS AND CONTIGUOUS RARE II AREA

BY

CLARENCE E. ELLIS

1981